

# PATENT SPECIFICATION (11)

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- (21) Application No. 54794/72 (22) Filed 27 Nov. 1972 (19)  
 (31) Convention Application Nos. 7 116 385 (32) Filed 26 Nov. 1971  
 7 203 947 24 March 1972 in  
 (33) Netherlands (NL)  
 (44) Complete Specification published 17 Dec. 1975  
 (51) INT. CL.<sup>3</sup> F16B 21/00  
 (52) Index at acceptance  
 E2B 13A1U



## (54) FASTENERS

(71) We, ARIE JOHANNES NIEWVELD and JOHN EMILE LEON WALTERS, both Dutch citizens, trading as CLIPCO B. V. I.O. of Toeperweg 10, Venlo, Holland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to fasteners for insertion into preformed holes.

According to the present invention there

tion which have only two legs will give satisfactory results. For some cases, however, it may be useful to provide more than two legs, e.g., when a greater fastening power is required or in each case of fasteners of heavier construction. 55

The exterior surfaces of the legs of preferred forms of fasteners according to the invention are provided with projections, e.g., in the form of knots, waves or teeth or combinations thereof. Exceptionally good results are obtained with legs that are partly or wholly built up from sectors of frusto cones: 60

## SPECIFICATION NO 1418003

By a direction given under Section 17 (1) of the Patents Act 1949 this application proceeded in the name of JOHN EMILE LEON WALTERS, a Dutch subject of Toeperweg 10, Venlo, Holland.

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abutment shoulders situated between the head and the legs.

In use, the fastener is pushed into the preformed hole and the legs thereby urged together. Because of the resilience of the material, these legs are biased apart and, because of the projections they bear, serve to fix the fastener securely in the hole. It is found that fasteners of this sort are much more tolerant of variations in hole size and shape than those of the prior type referred to above. In addition, fasteners of the present invention can be inserted easily, usually the pressure of the thumb being sufficient. Naturally, the size of the hole must bear some relation to the diameter of the unstressed fastener. The hole is preferably formed by drilling and is preferably of diameter equal to the outer diameter of the legs when these are biased together to contact one another. The legs can move relatively to one another and can thus adapt well to irregularities in the hole, while still acting to secure the fastener firmly in the hole.

50 Generally fasteners according to the inven-

or more nooks, or formed as a clamp for tools, wires, cables or pipes.

If the fastener according to the invention is intended to serve for fixing wires, cables, pipes and the like, it is advantageous to make the head of two separate parts, each of which bears one of the two legs. Such clamps can then easily be slipped over the wire, cable or pipe to be fixed, resulting in a very fast and convenient operation. However, it is not necessary always to mount the legs on separate head portions; in case of e.g., a tool clamp, both legs can be directly mounted on the base of the clamp, provided this base is big enough to give sufficient support to the legs. In case of a wire, cable or pipe clamp both legs can merge gradually into the, e.g., circular part of the clamp. 80 85 90

The fasteners according to the invention are generally intended for application in material of certain thickness, such as walls, stones, wooden walls, skirtings and the like. However, by careful construction, it is also possible to make fasteners according to the invention as dual purpose devices which can 95 100

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This invention relates to fasteners for insertion into preformed holes.

According to the present invention there is provided a fastener adapted for engagement in a generally cylindrical hole by pushing into that hole and comprising a head defining an aperture in the form of a clip or ring, a plurality of separate spaced apart legs, projecting from the head and extending substantially parallel, each leg being independently resiliently laterally deflectable from its unstressed position into the space between the legs when unstressed, and each leg bearing a plurality of outwardly directed protrusions for resilient engagement with the sides of the hole, there being one or more abutment shoulders situated between the head and the legs.

In use, the fastener is pushed into the preformed hole and the legs thereby urged together. Because of the resilience of the material, these legs are biased apart and, because of the projections they bear, serve to fix the fastener securely in the hole. It is found that fasteners of this sort are much more tolerant of variations in hole size and shape than those of the prior type referred to above. In addition, fasteners of the present invention can be inserted easily, usually the pressure of the thumb being sufficient. Naturally, the size of the hole must bear some relation to the diameter of the unstressed fastener. The hole is preferably formed by drilling and is preferably of diameter equal to the outer diameter of the legs when these are biased together to contact one another. The legs can move relatively to one another and can thus adapt well to irregularities in the hole, while still acting to secure the fastener firmly in the hole.

Generally fasteners according to the inven-

tion which have only two legs will give satisfactory results. For some cases, however, it may be useful to provide more than two legs, e.g., when a greater fastening power is required or in each case of fasteners of heavier construction.

The exterior surfaces of the legs of preferred forms of fasteners according to the invention are provided with projections, e.g., in the form of knots, waves or teeth or combinations thereof. Exceptionally good results are obtained with legs that are partly or wholly built up from sectors of frusto cones; in the preferred case of two legs, each can be formed of a plurality of truncated half-cones.

The head of the fastener according to the invention can be of any desired or suitable shape. In those cases where the fasteners according to the invention should be prevented from sinking too deeply into the bored hole, the head should be larger than the section which is divided into legs. The head may be like that of a nail, or the head can be shaped, for example, to include one or more hooks, or formed as a clamp for tools, wires, cables or pipes.

If the fastener according to the invention is intended to serve for fixing wires, cables, pipes and the like, it is advantageous to make the head of two separate parts, each of which bears one of the two legs. Such clamps can then easily be slipped over the wire, cable or pipe to be fixed, resulting in a very fast and convenient operation. However, it is not necessary always to mount the legs on separate head portions; in case of e.g., a tool clamp, both legs can be directly mounted on the base of the clamp, provided this base is big enough to give sufficient support to the legs. In case of a wire, cable or pipe clamp both legs can merge gradually into the, e.g., circular part of the clamp.

The fasteners according to the invention are generally intended for application in material of certain thickness, such as walls, stones, wooden walls, skirtings and the like. However, by careful construction, it is also possible to make fasteners according to the invention as dual purpose devices which can

be used for fixing either into thick materials as just noted or for fixing into thin materials, such as pegboard and steel plate. In such dual purpose fasteners part of the legs adjacent to the head of the fasteners, are specially shaped so that part of the legs can exercise a locking force by engagement behind the rear face of the thin material. This allows the fastener to be fastened in a hole of given diameter in thin material such as those just noted. The preferred construction of fasteners for fixing in thin material is effected by giving the projections the form of a half-cone and providing a short cylindrical or slightly tapered portion between the head and the projections.

If a dual purpose fastener according to the invention is to be used in thin material, it may be practical or even necessary to remove that part of the legs which serves no purpose. To facilitate such a removal it may be advantageous to provide a small severable portion between the parts of the legs nearer and further from the head.

The fasteners according to the invention are made from resilient material, preferably resilient plastics material. Particularly suitable materials are polyamide types.

The invention is illustrated, by way of example, with reference to the accompanying drawings in which:—

Figures 1 and 1a show a fastener according to the invention in side and plan view.

Figure 2 shows a wire clamp with a split head,

Figure 3 shows a fastener where the legs have been mounted directly on the base of a tool clamp,

Figures 4 and 5 are side and plan views of an alternative fastener according to the invention,

Figures 6 and 6a show the fastener of Figures 4 and 5 after removal of part of the legs,

Figure 7 is a sectional view of the fastener of Figures 4 and 5 placed in a hole drilled in a wall, and

Figure 8 is a sectional view of the fastener of Figures 6 and 6a fixed in this material.

Referring first to Figures 1 and 1a there is shown a clip formed integrally from polyamide plastics. The clip has a clip head 20, base 21 and two legs 22. In cross-section, each leg is semicircular.

Figure 2 shows a cable clip having a ring portion 23 for receipt of the cable, a stand-off portion 24 and two legs 25. Cable may be inserted in ring portion 23 by flexing legs 25 apart, to open the ring. Legs 25 are then brought together and pressed into a drilled hole.

Figure 3 shows a type of clamp analogous to that of Figure 2, but in which portion 24 is much reduced in size.

Referring to Figures 4 to 8, the integral plastics clip there shown comprises a base and a clip portion 3, an intermediate leg portion 2 and a further leg portion 1. Each leg comprises half conical portions 4, 5, 6 and 7. Between portions 1 and 2 are semi-cylindrical portions 9, while portion 2 includes semi-cylindrical portions 8.

As can be seen from Figures 6, 6a and 8, the two half conical legs 7 serve to facilitate the passage of portion 2 in compressed state through a hole of given diameter in thin material 11, after which the two legs spring apart to exercise their locking function at the backside of the hole in the thin material.

The legs 9 serve to facilitate the separation of portion 1, e.g., by breaking, cutting or the like, without causing damage to portion 2. If the clip is for use in a blind hole as shown in Figure 7, portion 1 is not removed and the installed clip is as shown. In such a construction it is found particularly advantageous to form the half cylindrical leg sections 8 slightly tapering inwardly towards portions 7, and to form half cones 4, 5 and 6 of gradually increasing diameter from back to front.

#### WHAT WE CLAIM IS:—

1. A fastener adapted for engagement in a generally cylindrical hole by pushing into that hole and comprising a head defining an aperture in the form of a clip or ring, a plurality of separate spaced apart legs projecting from the head and extending substantially parallel, each leg being independently resiliently laterally deflectable from its unstressed position into the space between the legs when unstressed, and each leg bearing a plurality of outwardly directed protrusions for resilient engagement with the sides of the hole, there being one or more abutment shoulders situated between the head and the legs.

2. A fastener according to claim 1 formed integrally of resilient plastics material.

3. A fastener according to claim 1 and formed of polyamide plastics material.

4. A fastener according to any one of claims 1 to 3 wherein the head is formed as a spring clip.

5. A fastener according to any one of claims 1 to 3 and having two legs wherein the head is in the form of a split ring, the ends of the ring on each side of the split each carrying one leg.

6. A fastener according to any one of claims 1 to 5 wherein there are two legs each including a series of half-conical portions.

7. A fastener according to any one of claims 1 to 6 wherein the legs are attached

to the head in such fashion as to allow the device to be fastened in a hole in thin material.

- 5 8. A fastener according to claim 7 wherein the legs are formed from half-conical portions and are connected to the head via intermediate half-conical portions which taper slightly inwardly away from the head.

- 10 9. A fastener according to claim 7 or 8 wherein each leg includes a section of reduced cross-section to provide an easily severable zone in the leg.

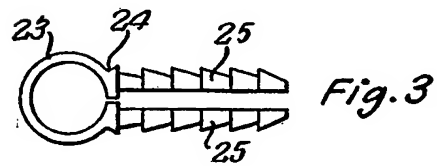
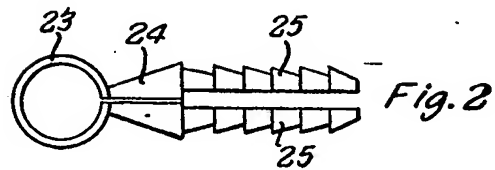
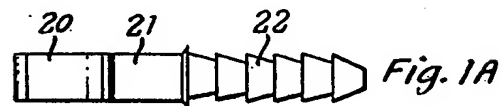
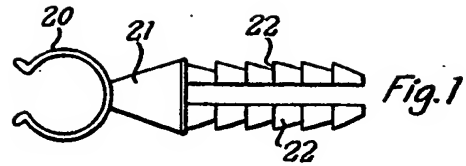
10. A fastener substantially as hereinbefore described with reference to Figures 1 to 3 of the accompanying drawings.

11. A fastener substantially as hereinbefore described with reference to Figures 4, 5 and 7 of the accompanying drawings.

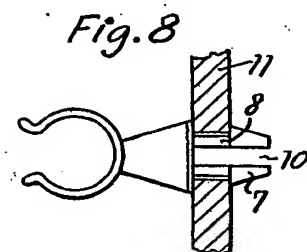
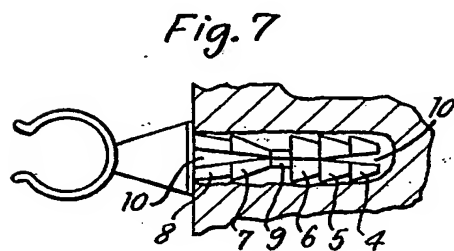
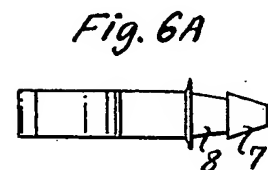
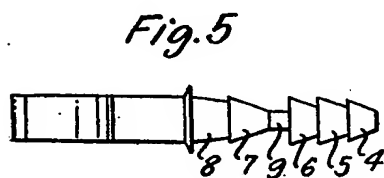
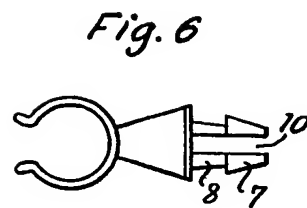
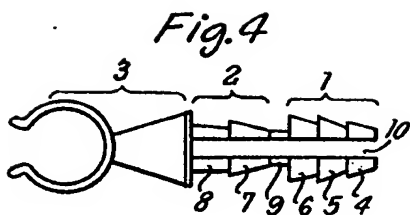
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